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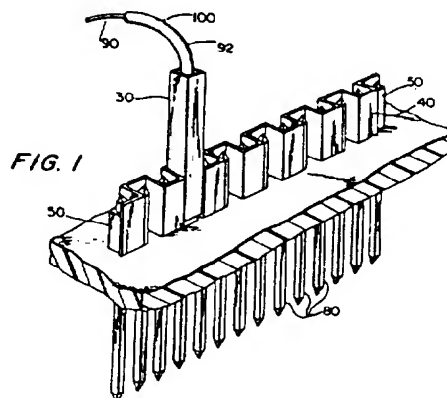
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(54) **A connector for coaxially shielded cable.**

(57) A connector for connecting conductors of a coaxially shielded cable 100 to male contacts 80 disposed in a row comprise an inner contact for connecting an inner conductor 90 of the cable to a male contact 80, an outer rectangular-section contact 30 spaced and insulated from the inner contact and connected to an outer conductor 92 of the cable, and a further contact (40 or 60) electrically connecting the outer contact 30 to one of the male contacts 80.



A CONNECTOR FOR COAXIALLY SHIELDED CABLE

This invention relates to connectors for connecting conductors of coaxially shielded cables to non-coaxial male contacts.

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Coaxially shielded cables are well known as the highest fidelity signal wiring for digital signals and analog signals throughout the microwave frequency range. The advent of large scale integrated circuits has increased the density and complexity of electronic circuitry to the point where coaxially shielded cables are often required for interconnection in high density applications. However, the usefulness of coaxially shielded cables has been limited by cumbersome and time consuming connection methods.

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A requirement exists for an improved connector which allows the use of coaxially shielded cables in existing, well-developed hardware systems for packaging electronic circuitry.

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According to the invention, there is provided a connector for connecting conductors of coaxially shielded cables to non-coaxial male contacts disposed in a row, said connector characterised by a first inner contact compatible with each of a plurality of the male contacts, said first inner contact being electrically and mechanically connected to a first inner conductor of one of the coaxially shielded cables, an electrically insulating element surrounding the first inner contact, an outer rectangular-section contact surrounding the insulating element, electrically and mechanically connected to an outer conductor of one of the coaxially shielded cables and fastened to the jacket of said coaxial cable, and a further contact electrically connecting one or more of the outer contacts

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to one or more of said male contacts or to an external circuit.

5 The invention will now be particularly described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is a perspective view of the first embodiment of the invention showing an auxiliary contact;

10 Figure 2 is a perspective view of a second embodiment of the invention showing a supplemental contact; and

Figure 3 is an axial cross-sectional view of a portion of a first embodiment of the invention showing the first inner contact, the outer contact and the insulating element.

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A first embodiment of a coaxial connector according to the present invention is described with reference to Figures 1 and 3 wherein like elements have like numbers. A first inner contact 10 comprising a standard contact which is
20 fully compatible with the standard, non-coaxial round pin or square post male contacts 80 commonly used in packaging electronic circuitry is connected to a first inner conductor 90 of a coaxial cable 100 at junction 91. The standard square post male contacts 80 can be of lengths
25 varying from approximately 0.2 inches (5 cms) to approximately 1 inch (2.5 cms) and transverse facial dimensions of 0.025 inches (0.064 cms) square. Round pin male contacts are typically between .020 inches (0.051 cms) and .035 inches (0.089 cms) in diameter.

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An electrically insulating medium 20 surrounds the first inner contact 10 and extends axially along the surface of the first inner contact 10.

35 The insulating medium 20 is surrounded by an outer contact

- 3 -

30 to which is connected the outer conductor 92 of a coaxial cable 100. The axes of the first inner contact 10 and the outer contact 30 are substantially mutually coincident or parallel. The outer contact 30 is a
5 hollow rectangular-section solid having a transverse face of which the dimension of the side extending along the row of contacts 80 is slightly smaller than the center-to-center distance of the contacts 80. This center-to-center distance can be as small as 0.100 inches (0.254 cms).

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An auxiliary contact 40 is installed among a row of standard male contacts 80 by connecting a socket 50 of contact 40 onto a standard male contact 80 or by connecting two spaced sockets 50 of contact 40 on to two
15 standard male contacts 80 spaced apart along a row of male contacts 80.

The auxiliary contact 40 can be made from a strip of any highly conductive material. The shape of the auxiliary
20 contact 40 is such that a portion of the auxiliary contact 40 contacts a portion of the outer contact 30 whenever an outer contact 30 is connected to one of the standard male contacts disposed in a row. For example, the auxiliary contact 40 can be shaped as a square wave,
25 made of springy metal strip and installed among a row of standard male contacts 80 such that, whenever an outer contact 30 is connected to one of the standard male contacts, three axial faces of that outer contact 30 contact portions of the auxiliary contact 40. Of course,
30 other shapes are possible which will also provide sufficient contact between the auxiliary contact 40 and an outer contact 30.

The outer contact 30 can be selectively supplied with an
35 electrically insulating coating to leave exposed only

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portions of the outer contact 30 which serve as electrical contact points.

The advantage of the auxiliary contact 40 is that the
5 outer conductors of several coaxial cables can be
efficiently connected together and to the electronic
circuitry. This prevents wasting space that occurs if
the outer conductors are separately tied together or if
each outer conductor is separately tied to the electronic
10 circuitry. For example, the outer conductors can all be
tied to ground by connecting the socket 50 of the
auxiliary contact 40 to a standard male contact which is
grounded. This eliminates the need for separately
grounding each outer conductor.

15 A modification of this embodiment can be achieved by
selectively applying an electrically insulating coating
to the outer contact 30 and to the auxiliary contact 40
to leave said contacts exposed substantially only at
20 their interface.

A second embodiment of a coaxial connector according to
the present invention is shown in Figure 2. Instead of
using an auxiliary contact, this embodiment contains a
25 supplemental contact 60. The supplemental contact 60
is disposed for connection to a male contact 80 adjacent
to the male contact to which the first inner contact 10
of the connector is connected. The supplemental contact
60, which can be of trough shape as illustrated, is com-
30 patible with each of the standard male contacts 80, and
is oriented so that its axis is substantially parallel to
the outer contact 30. One axial face of the supplement-
tal contact 60 is mechanically connected to a portion of
one axial face of the outer contact 30 by a connecting
35 element 70, for example, so that an electrical connector

subsists at the interface.

This embodiment containing the supplemental contact 60 is useful when the outer conductor of coaxial cables
5 must be connected to electronic circuitry and yet not all of the outer conductors are to be connected to the same electronic circuit.

The above embodiments can be easily modified to provide
10 for a second inner contact (not shown) connected to a second inner conductor of a coaxial cable and compatible with the standard male contacts. The second inner contact must be electrically insulated from both the first inner contact 10 and the outer contact 30 and must be
15 disposed so that the distance from the center of the second inner contact to the center of the first inner contact 10 is equal to the center-to-center distance of the male posts 80. In such a case, the shape of the outer contact 30 and the auxiliary contact 40 must be
20 appropriately modified. No modification of the supplemental contact 60 is necessary.

It will be apparent that the number of connectors to be used will be limited by the number of male contacts which
25 are not directly engaged by an auxiliary contact or a supplemental contact.

CLAIMS

1. A connector for connecting conductors of coaxially shielded cables to non-coaxial male contacts disposed in a row, said connector characterised by a first inner contact compatible with each of a plurality of the male contacts, said first inner contact being electrically and mechanically connected to a first inner conductor of one of the coaxially shielded cables, an electrically insulating element surrounding the first inner contact, an outer rectangular-section contact surrounding the insulating element, electrically and mechanically connected to an outer conductor of one of the coaxially shielded cables and fastened to the jacket of said coaxial cable, and a further contact electrically connecting one or more of the outer contacts to one or more of said male contacts or to an external circuit.

2. A connector according to claim 1 further characterised by an insulating coating selectively applied to the outer contact and to the further contact to leave said contacts exposed substantially only at the connection between said outer contact and the further contact.

3. A connector according to claim 1 or claim 2, characterised in that said further contact is an auxiliary contact which is disposed among the male contacts.

4. A connector according to claim 3, characterised in that the auxiliary contact is a square wave shaped springy metal strip.

5. A connector according to claim 1 or claim 2, characterised in that said further contact is a supple-

mental contact compatible with each of a plurality of the male contacts, oriented substantially parallel to the outer contact, electrically and mechanically connected to said outer contact, and disposed for connection to a male
5 contact adjacent to the male contact to which the inner contact is connected.

6. A connector according to any preceding claim, characterised by a second inner contact compatible with
10 each of a plurality of the male contacts, housed within the outer contact, separated from said outer contact and from the first inner contact by the insulating element, and electrically connected to a second inner conductor of one of the coaxially shielded cables.

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7. A connector according to any preceding claim, characterised in that the width of each outside face of the outer contact which lies along said row is slightly smaller than the center-to-center distance of the male
20 contacts disposed in a row.

8. A connector according to any preceding claim, characterised in that said male contacts comprise square posts.

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9. A connector according to any one of claims 1 to 7, characterised in that said male contacts comprise round pins.

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FIG. 1

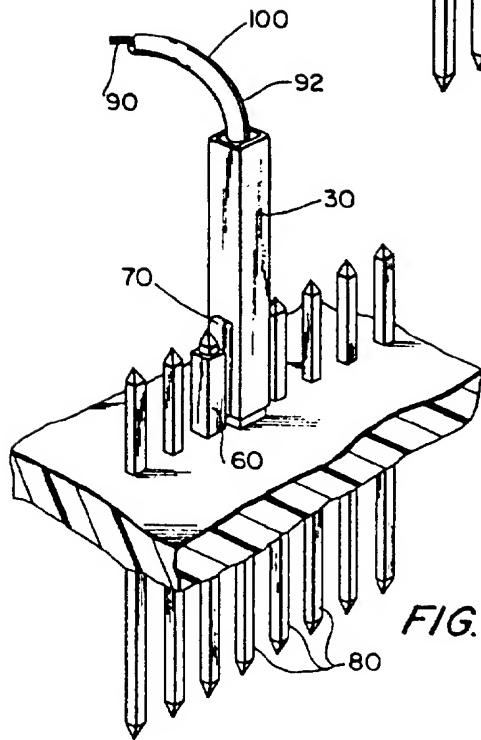
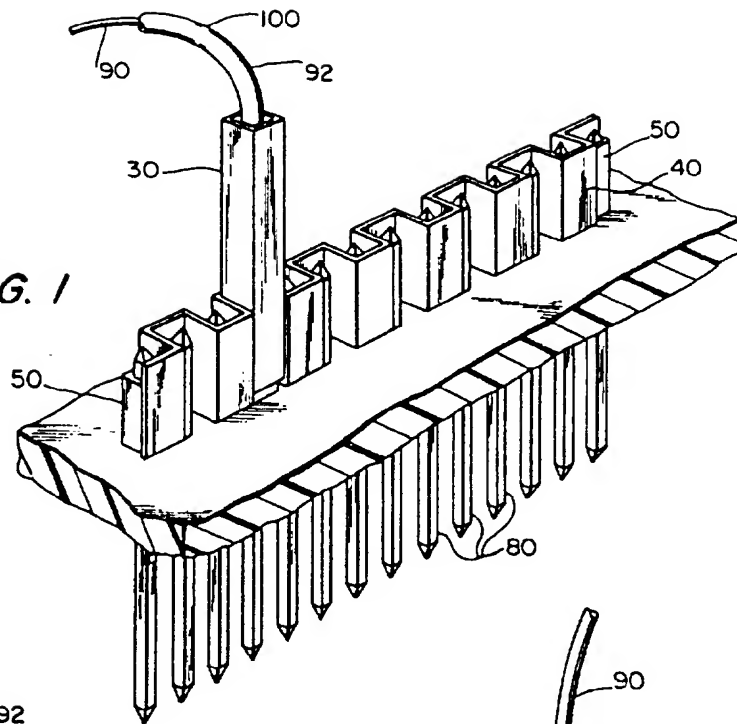
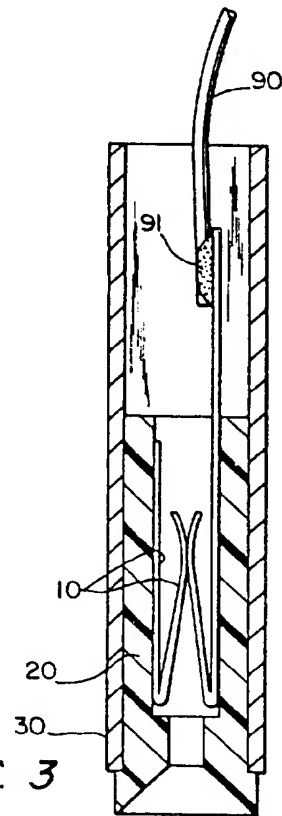


FIG. 2

FIG. 3





European Patent
Office

EUROPEAN SEARCH REPORT

0074205

Application number

EP 82 30 4427

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
X	<p>FR-A-2 334 267 (DU PONT)</p> <p>*Figures 1,2; page 4, line 39 to page 5, line 15; page 6, line 37 to page 7, line 9*</p>	1-4, 6, 8	<p>H 01 R 13/658</p> <p>H 01 R 17/12</p>
X	<p>US-A-3 533 044 (IBM)</p> <p>*Figures 1,2; column 2, line 43 to column 3, line 3; column 3, lines 40 to 55*</p>	1, 3, 4, 8	
A	<p>DE-C-1 231 776 (RCA)</p> <p>*Figure 1; column 3, line 57 to column 4, line 13*</p>	4, 5	
A	<p>IBM TECHNICAL DISCLOSURE BULLETIN, vol. 21, no. 4, September 1978, pages 1571-1572, New York (USA);</p> <p>R.O.KAHL: "Ground strip adapter for tri-lead cable" *Figures 1,2; page 1571*</p>	1, 3, 4	<p>TECHNICAL FIELDS SEARCHED (Int. Cl. 3)</p> <p>H 01 R 9/00</p> <p>H 01 R 13/00</p> <p>H 01 R 17/00</p>
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 06-12-1982	Examiner WAERN G.M.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone</p> <p>Y : particularly relevant if combined with another document of the same category</p> <p>A : technological background</p> <p>O : non-written disclosure</p> <p>P : intermediate document</p> <p>T : theory or principle underlying the invention</p> <p>E : earlier patent document, but published on, or after the filing date</p> <p>D : document cited in the application</p> <p>L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			